

Appl. No. : 10/772,101
Filed : February 4, 2004

AMENDMENTS TO THE CLAIMS

1-110. (Canceled)

111. (New) A prosthetic cardiac valve assembly for use in replacing a deficient native cardiac valve, the valve assembly comprising:

a prosthetic cardiac valve having a plurality of commissure points, a plurality of resilient leaflets, and a base; and

a prosthetic cardiac valve support configured to be collapsible for transluminal delivery and comprising a first and a second portion, said prosthetic cardiac valve support supporting the base, said first portion expandable to contact the anatomical cardiac annulus of the native cardiac valve when the cardiac valve assembly is properly positioned, said second portion supporting the commissure points of the valve, said second portion comprising a first section and a second section, said first section configured to be radially restrained so as to have a smaller diameter than the first portion when the valve support is maximally expanded, said first section further configured to expand to a diameter that is less than the diameter of the cardiac annulus and less than the diameter of the ascending aorta.

112. (New) The prosthetic cardiac valve assembly of Claim 111, further comprising a radial restraint that is configured to act, at least in part, upon the first section.

113. (New) The prosthetic cardiac valve assembly of Claim 112, wherein the radial restraint comprises a wire.

114. (New) The prosthetic cardiac valve assembly of Claim 111, wherein the second section is expandable to contact the ascending aorta.

115. (New) The prosthetic cardiac valve assembly of Claim 114, wherein the commissure points are supported by the second section.

116. (New) The prosthetic cardiac valve assembly of Claim 112, wherein the radial restraint is capable of substantially resisting collapse below a preset diameter.

117. (New) The prosthetic cardiac valve assembly of Claim 111, wherein the prosthetic cardiac valve support comprises a drug-eluting support.

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118. (New) The prosthetic cardiac valve assembly of Claim 111, further comprising an anchor for engaging the lumen wall when expanded in place for preventing substantial migration of the valve assembly after deployment.

119. (New) The cardiac valve assembly of Claim 111, wherein the prosthetic cardiac valve support comprises at least one wire.

120. (New) The prosthetic cardiac valve assembly of Claim 119, wherein the prosthetic cardiac valve support comprises a single length of wire.

121. (New) The prosthetic cardiac valve assembly of Claim 120, wherein at least one portion of the single length of wire has a reduced thickness to decrease the radial expansion force.

122. (New) The prosthetic cardiac valve assembly of Claim 112, wherein the radial restraint comprises a thread.

123. (New) The prosthetic cardiac valve assembly of Claim 112, wherein the radial restraint comprises a mechanical stop.

124. (New) The prosthetic cardiac valve assembly of Claim 112, wherein the radial restraint comprises material from which at least a portion of the valve support is made so that the second portion does not expand beyond a preset diameter.

125. (New) The prosthetic cardiac valve assembly of Claim 124, wherein the material comprise shape memory material.

126. (New) The prosthetic cardiac valve assembly of Claim 112, wherein the radial restraint comprises a cuff.

127. (New) The prosthetic cardiac valve assembly of Claim 112, wherein the radial restraint comprises a stent configured to cooperate with the valve support so as to substantially preclude recoil.

128. (New) The prosthetic cardiac valve assembly of Claim 111, wherein said first portion is configured to be expanded by a balloon catheter.

129. (New) The prosthetic cardiac valve assembly of Claim 128, wherein said first portion is configured to be expanded beyond its yield point in situ.

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130. (New) The prosthetic cardiac valve assembly of Claim 111, further comprising a cardiac valvular ring stent configured to expand in situ for pushing against the residual native cardiac valve components.

131. (New) The prosthetic cardiac valve assembly of Claim 130, wherein the cardiac valvular ring stent is configured to reside within the prosthetic cardiac valve support portion when deployed.

132. (New) The prosthetic cardiac valve assembly of Claim 130, wherein the cardiac valvular ring stent is configured to reside outside the prosthetic cardiac valve support portion when deployed.

133. (New) The prosthetic cardiac valve assembly of Claim 112, wherein the radial restraint is configured to reduce recoil.

134. (New) The prosthetic cardiac valve assembly of Claim 111, wherein the first portion is configured to expand in situ for pushing the residual native cardiac valve components against the native cardiac annulus and surrounding tissue.

135. (New) The prosthetic cardiac valve assembly of Claim 130, wherein the cardiac valvular ring stent is self-expanding.

136. (New) The prosthetic cardiac valve assembly of Claim 130, wherein the cardiac valvular ring stent is configured to be expanded by a balloon catheter.

137. (New) A prosthetic cardiac valve assembly configured for endoluminal delivery to replace a deficient native cardiac valve, the prosthetic cardiac valve assembly comprising an axial cardiac valve support portion configured to support a prosthetic cardiac valve having at least one leaflet and to prevent substantial interference with the positioning and/or operation of the prosthetic cardiac valve by any residual components of the native cardiac valve, including calcified native cardiac valve components, said support portion comprising at least one radial restraint at a first section of said support portion to preclude expansion when deployed in situ substantially no greater than a preset diameter to increase coaptivity of the prosthetic cardiac valve leaflets and to prevent significant prosthetic cardiac valve regurgitation, said preset diameter less than the diameter of the cardiac annulus and less than the diameter of the ascending aorta, and a second section configured to expand in situ for pushing the residual native cardiac valve components against the native cardiac annulus and surrounding tissue, wherein the second

section is configured to expand to an expansion diameter greater than the preset diameter of the first section.

138. (New) The prosthetic cardiac valve assembly of Claim 137, wherein the radial restraint is configured to reduce recoil.

139. (New) The prosthetic cardiac valve assembly of Claim 137, wherein the radial restraint comprises a mechanical stop.

140. (New) The prosthetic cardiac valve assembly of Claim 137, wherein said second section is configured to be expanded by a balloon catheter.

141. (New) The prosthetic cardiac valve assembly of Claim 140, wherein said second section is configured to be expanded beyond its yield point in situ.

142. (New) The prosthetic cardiac valve assembly of Claim 137, further comprising a cardiac valvular ring stent configured to expand in situ for pushing against the residual cardiac native valve components.

143. (New) The prosthetic cardiac valve assembly of Claim 142, wherein the cardiac valvular ring stent is self-expanding.

144. (New) The prosthetic cardiac valve assembly of Claim 142, wherein the cardiac valvular ring stent is configured to be expanded by a balloon catheter.

145. (New) The prosthetic cardiac valve assembly of Claim 137, further comprising a stent configured to reduce the recoil of the support portion following self-expansion of the support portion.

146. (New) The prosthetic cardiac valve assembly of Claim 142, wherein the cardiac valvular ring stent is configured to reside within the valve support portion when deployed.

147. (New) The prosthetic cardiac valve assembly of Claim 142, wherein the cardiac valvular ring stent is configured to reside outside the valve support portion when deployed.

148. (New) The prosthetic cardiac valve assembly of Claim 137, further comprising at least one anchor configured to exert sufficient radial forces against the lumen wall to prevent substantial migration.

149. (New) The prosthetic cardiac valve assembly of Claim 137, wherein said radial restraint comprises a wire.